

AVIATION

The Oldest American Aeronautical Magazine

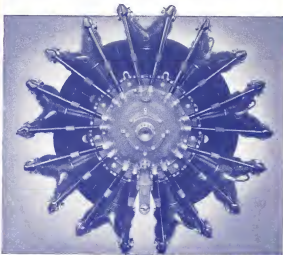


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The Olden American Aeronautical Magazine

EDWARD F. WARDEN, Editor

DAVID F. LINDSAY, Publishing Director

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AVIATION
February, 1937

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* SCHEDULES *

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AVIATION

FOR JANUARY 1933

1932 passes into history

Closing months of a lean year show promise for the future

SOME YEARS GO down as history in periods of fulfillment, while others furnish mainly background for the future. As this particular year closes there seems to be realistic indication, for the first time in many months, that that elusive and long awaited turning-point has been reached.

Efficient transportation has done much to stem the tide of red ink, and black figures are beginning to appear sporadically. The production groundswell has emerged from its deep sleep, passed, and leaving no shadow of surplus stocks has decided to remain awake. It has found interesting material with which to work in the areas of design uncovered in 1932. The quantitative aspect of this plan is discussed in the prophetic parable of this issue. The prospects have been enhanced by the re-organization of the merchandising talent of the industry, which has been looking outward and across the seas toward markets born of the military demands of certain nations of South America and Europe. While production is reviving, transport continues to grow at a rate that is amazing in the light of the present economic climate. Operations have responded to ever-increasing popular demand by increasing the real service rendered to the public for every dollar received, a time-worn and reliable formula for success, and have made their customer feel by their competition.

Was reality as accepting the course of Progress and overruling, foolishness, continuing on fixed methods, and making a large battle against nature?

With the passing of the romantic era comes a changing attitude toward the public relationships of aeronautics as a whole. Such time-worn traditions as the National Aircraft Show, National Air Races and National Air Year have been definitely affected. This year's experience has indicated that neither the show nor the races, as organized in the past, merely met the challenging demands of a deflated industry, and there is a widespread belief that in 1933 the show will be omitted and the races curtailed. The National Air Year has already fallen by the wayside and, for the first time in many years, was omitted in 1932.

Early in January, 22 privately owned planes started from Jacksonville, Fla., for Miami, Fla., on a cruise sponsored by the American Air Pilots' Association. In spite of very undesirable weather, eight landed on time and others later.

A universal engine crisis was held on Long Island Sound under the most auspicious during the summer.

Transport

While other transport agencies, divided against themselves, expended their diminishing resources and the public money in their struggle for ex-

istence, air transport has been growing at a rate that few other businesses could equal during the depression period.

Comparing the first nine months of 1931 with the same period in 1932, the passenger miles flown increased from 986,215 to 1,077,864. An even greater gain was shown in air express. In the nine months' period of 1931, 953,893 lb. were carried. This has increased for the same period in 1932, to 1,018,979 lb.

Throughout the year there has been a general downward trend of air fares. Beginning early in January, several of the major operators featured fare reductions of 10 to 20 per cent, bringing their average fare to approximately 6.2 cents per mile. At the peak of the summer business, a \$5 ticket here from New York to Washington, subject to empty seats on selected schedules, was sold by the Lockheed Line. The practice of selling tickets in quantities at a reduced rate also was hastened.

Decreases in actual city-to-city time through increased service, co-ordination of schedules and improved ground connections has done much to bring passengers to the airlines, and in connection with bus operators and with the more enlightened individuals has also multiplied. Through coast-to-coast service with night departures and, likewise, with slightly more than 24 hours' layover and only one stop, and with more rapid service is provided for the immediate future. Night schedules have been very heavily patronized.



Top left: biplane. Top right: liner. Bottom left: propeller. Bottom right: pilot.

Distribution of airline tickets has been expedited through an agreement with two operators and telegraph companies. A central ticket office has been experimentally established in New York by the Postal Telegraph Company.

Independent airline operation interfered a severe blow when E. L. Cord refused to cut his ties with the rail companies and, through an agreement with the airlines, gained control of the Aviation Corporation. The first step in the strategic sequence was the sale of Century Airlines to the Aviation Corporation, in April, as consideration of approximately \$40,000 of the 323,683 shares of stock then held by the Aviation Corporation treasury. That was followed by the gradual acquisition of the stock by the Cord interests, at 25 or 30 per cent of the total of 1,800,000 shares in the closing months of the year. The next move was made by the corporation, which attempted to acquire a large part of the assets of North American Aviation in exchange for Aviation Corporation stock which would have placed the Cord interests appreciably. In the ensuing May, the Cord case came out on top, as reported in *Aviation* in the News section of this issue. Later, following, entered the air transport picture early in 1932 when Century Airlines introduced a wage readjustment to which the pilots and certain executives failed to agree. After a month of quiet hostility due to a strike or lockout, relations were reconciled and resumed, while the dispute was carried to Congress and the Chicago City Government accompanied by a flood of publicity from both sides. The domestic situation was settled, but it had the indirect effect of widening the pilots on all lines together with a new sense of their common interest and strengthening their solidarity.

On July 18, following an agreement between seven major carriers, the first national independent air express system began operation under the name of General Air Express. The arrangement provided a valuable facility for shippers operating under these lines and provided domestic door-to-door service at rates up to 300 lb. through an agreement with Postal Telegraph. Another group of airlines has recently affiliated to the Railway Express Agency, and operates under a system of rate-plan coordination, splitting the mailing costs pack-up and delivery facilities. Substantial reduction in rates was put into effect in December by the Railway Express Agency, following another reduction early in the year.

The air mail rate was raised on July 13 to 8 cents for the first ounce or fraction thereof, and 12 cents for each additional ounce. A 36 per cent drop in air mail postage resulted. There has been a continuous decrease

word length in air mail contract rates as a result of various revenue made by the Post Office Department in the last few years.

Design and construction

Although the primary emphasis of 1932 design effort was on transport types a number of new ships for special use appeared. Very few of the aircraft variety were of aviation type. The trend was rather toward sea-going, multi-media-hull designs, many adapted for shallow-water landing, with complete control of ranging style from the demonstrable "water top" introduced by Mako and Kellie, to the extreme type typified by the Fairchild 36, the Stinson 16, the new Princeton, and the Keweenaw. Berchert embodied negative stagger and a split radial air intake. The 1932 Princeton had employed a welded steel side framework, oval bottom, and heavy canvas sides.

In transport design, the year 1932 will be remembered as a turning point for designers have generally realized that economy lies in the direction of replacing 1928-1929 design equipment with something more suitable in 1932-1933 requirements. The only transport machine which actually put an appearance during the year was the British Model 17, but General Aviation, Lockheed, Vickers, and others have high speed single engine, low-wing monoplanes completed or in various stages of construction, the Boeing transport is soon to be flown, and Corporation is completing a new Constellation with no-cooled engines. Study of the literature on the way for Daimler-Benz, Messerschmitt, as well as designers, have been considered in the laying out of new transport ships, and many design considerations and specifications have been written for the guidance of the builder. Landing water-borne monoplanes have been included for maintenance, special use. See *Aviation*, January, February 1932.

A number of retractable landing gear designs are in evidence or in prospect. A low-retracting design was used by Berchert and the Ford plant, and a retractable landing gear on General American's Avianor is the Coast Guard. The failure of the new Ford A-12 to appear and the almost universal adoption of ten to twelve seats as the maximum for the new transport indicates a trend away from the 1928-31 idea of super-toppers.

Practically all of the new transports have been studied from the standpoint of maximum freedom of movement for passengers, both with respect to headroom and seating arrangement. Pilot-controlled landing and landing systems are also the subject of great deal of attention has been paid to noise-reduction in cabins, both through re-

AVIATION January, 1933

duction of proper lip speed by engine exhaust and by exhaust-noise insulation.

Power plants

Interest in engines of small horsepower, in particular during 1932, has practically responded during the past twelve months. Women's feet of the latest A-7 C issued in 1932 were for engine and 50 hp, but a single one of the 16 A-7 C's in 1932 have been below the 150-hp class. The trend has been toward the engine engines for night of the engine are rated at 25 hp or better.

Without exception all engines approved during the year have been air-cooled, and with only one exception (American Eagle) mounted vertically (epher V) all have been radial types. Horsepower ratings have been advanced by increasing supercharging and by increasing compression ratios.

Design progress has been steady but slow. Motor improvements have been announced by Packard, and several new engines have appeared. Pratt & Whitney introduced a direct injection Horner which burned kerosene from a reservoir of oil provided in flight bi-hydrogenated or so-called "self-heating" after several years of laboratory testing, has been placed on the market for experimental use. Double-row or "over" radial engines which were at the same stage at the end of 1931, introduced in 1932.

Liquid-cooled will hold its own in the Air Corps, but appears to be losing its slender grip on the transport field. The Curtiss Corporation, as the single active representative of the liquid cooled class, reported during 1932 no new power and supercharged from.

The combination of forged aluminum blades and forged metal hub is still standard for propellers, although there has been a marked interest in the development of hollow and blades. Controllable pitch devices have come in the two types, and a number of practical models have been made available. The world's lightest propeller was made with a controllable pitch propeller.

Progress in research

With respect to aerodynamic research, the year 1932 was a turning-point for the better than others due to the institution during that period of fairly improved facilities at the NACA, Langley Research, and Langley Field. The value of the full-scale tunnel in solving specific design problems has been demonstrated, and an extensive program of investigation of wing plan and lifts is now under way in the new testing basin. In general, the year's work at the NACA has been devoted to improvement of airfoil efficiency, safety in flight, and improvement in design and operation. In spite of adverse business conditions the as-

sum annual conference of the NACA with representatives of the industry was well attended, and great appreciation was expressed by the industry for the research's valuable work.

High laboratory air flight tests have been evaluated on spinning, and in models for the control of aircraft in low speeds. In this connection, a number of high lift wing designs, both fixed and movable, have been revealed. A great deal of work has also been done in the wind tunnel in the connection with the control of the neighborhood of monoplane wings, and it has been determined that the optimum properly has function, both from the standpoint of reducing drag and high propulsive efficiency, is in line with 25 to 28 per cent of the chord ahead of the leading edge.

Tests have been continued on aerodynamics with new instruments, and a great deal of light has been shed upon the distribution of both under various conditions.

Power plants have come in for their share of attention. Cylindrical scavenging, direct injection, two-stroke cycle, and induction have been investigated, as well as the effect of using the so-called safety belts and their relationship to the first hand in airplanes. In connection with drag reduction experiments, much has been learned about the shape and location of cowling, and its effect on engine temperatures. The thrust problem has not been neglected.

In the field of materials, investigation has centered on the aluminum-alloy alloys and the aluminum-alloy alloys as applied to aircraft. The general adoption of stainless steel has not come about as rapidly as was predicted at the end of 1921, but progress is being made. The difficulties which were encountered with stainless and welding have largely been overcome by improved composition control. Composition control continues to be of first rate importance. An outstanding development has been a discovery that a Babbitt corrosion prevented with oil-soluble aluminum powder is especially effective to control severe exposure conditions.

A great deal of thoughtful and experimental work has been conducted in connection with the construction of small monocoque fuselages. Extensive tests have been run on typical assemblies of various types.

Outstanding among the work of other laboratories is a study of the effect of lift on wing-fuselage interference made at the California Institute of Technology for Northrop (see page 28).

Aviation

In 1932 closed, approximately 79 airlines are in daily service day a wide variety of purposes, among which are advertising, demonstrating, promoting forest fire control, police work and

Below is the Pratt & Whitney engine used in the new American Airlines passenger liner. Above is the Pratt & Whitney engine used in the new American Airlines passenger liner. Below is the Pratt & Whitney engine used in the new American Airlines passenger liner.



The top photograph shows a biplane in flight, viewed from a low angle. The middle photograph shows a biplane on a runway, viewed from a low angle. The bottom photograph shows a biplane on a runway, viewed from a low angle. In the foreground of the bottom photograph, there is a small table with numbers.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Top 16 Bottom: The 160-page glossy is chock-a-block with color by General Air Express. Headlines include: "The N.A.A.A. needed Jesus, Arctic intervention in Beijing, Vietnam: World's Sweetest Smell," "Bitterballer goes African Model R."

Many thousands of miles were covered and hours of experience were accumulated in the operation of lighter-than-aircraft during 1922. The flight of the U. S. S. Akron and those of the Graf Zeppelin have been watched with interest by various audiences of trans-oceanic, durable service.

The U. S. S. *Maize*, sister ship of the *Alamo*, just 8000 lb. lighter, approached completion. The Goodyear-Zepppelin Corporation has under construction for the United States Army the largest non-rigid airship ever built in this country. This ship, the TC-15 will have a gas capacity of 365 cu ft. with a gross lift of 22,500 lb., a length of 215 ft., and a diameter of 94 ft. These figures were established in the Goodyear-DeLander during 1932, and noted.

The International Balloon Race starting at Basel, Switzerland, Sept. 25, resulted in the victory for the United States Navy Balloon Pilots, by Lieut. Col. T. J. W. Seaford.

First arrivals participated in all meetings and concentrations during the year, operating under all conditions restricted, including some untidy weather. The outstanding features were the observation of a few fish swimming and fighting, the use in long distance point of a place based on features and on flow at basin, and the increased use of catfish-leashed fish for crabs and bathings. The great aquaria were very active throughout the year. Estimates are that the number of fish has been about 100. On June 30 the Los Angeles was decommissioned as a company station.

Due to failure of enactment of the bill submitted to the last Congress providing 114 airplanes for the new aircraft carrier, U. S. S. Ranger, the Navy used provision that stop within the 1,000 airplanes now authorized. The program for extra table powder catapult installation on the quarter decks of all battleships has been completed.

As a result of successful trials of experimental models, the first dryplants designed as dive bombers, and the first fighters for use in aerobics were

ordered for service. A last super-
sonic two-seater fighter with retract
side landing gear passed successful
tests, and is being developed for service.

The development field of experimental power plants has been narrowed to conform to the very definite and current needs of naval aviation. The power output of existing server types of engines has been increased by about 10 per cent for the same plant displacement. Endeavors totaling of 450 hours is now specified. Upward revision of the specifications for fuels and lubricants have been made to take advantage of the refining advances.

An improved standard cost accounting plan has been placed in effect at overhead bases. Comparison of costs and adoption of the most efficient overhead practices now becomes possible.

Researches are under way to provide the novice with a satisfactory, quick-attachable parachute, and several types are undergoing service tests. Many new instruments have been developed.

The practice of rigid economy in Army Air Corps expenditures has resulted in a saving of more than two million dollars, with most incurred in the Treasury. This has necessitated a reorganization of the Air Corps Five-Year Program and the new result is that the expenditure of the Army is about 120 airplanes of the 1800 previously accepted objective set forth by the Five-Year Program. Of the 275 new airplanes procured or contracted for during the fiscal year 1932, the large majority were tactical types, only 16 training type airplanes being selected for service tests.

These precautions included initial service test qualities of the new type bombardment, attack and observation planes having performance far exceeding that of any previous bomber type, and government for the fiscal year 1933 will be devoted to such airplanes of this group as may prove satisfactory in service tests. Practically all of the new improved airplanes are monoplanes embracing steel construction.

A wide range of projects was started as in the field of research. In addition to the experimental work in question with the previously mentioned improved design, tests were conducted on a low-wing metal monoplane for pursuit service. It is hoped that a great step to pursuit development will result.

Work of importance not only to the Army, but to the established services as well, has been done in aerial navigation, with particular attention to the problems of the flying and blind landing.

Highlight of 1932 was a brief spent trial by Max James H. Doobrie, breaking the one world's record which had

completed all stints during almost eight years, that his landplane speed is 10.5 mph. A Wasp-powered Gen. Ray Super sponsored four laps over the P. A. 1.000, breaking this kilometer course at an average speed of 294.30 m.p.h., 13.91 miles faster than the record set by Officer Bonnet of France in 1934.

Capt. André Urvoy in a Vickers Vimy, with British Purman engineers, raised the world's altitude record for airplanes to 43,900 ft., 800 ft. above the ceiling reached by Lt. Col. Apollo Smolch in the U. S. Navy in June, 1930. In his hydrogen-filled balloon Prof. August Reissner rose about two miles higher in the stratosphere, but it was not possible to better by 1,625 ft. the altitude record set by him at 32,300 ft. in 1928. Lucien Bossuport and Emile Rossi surpassed the world's oldest stratospheric record taken from Donjon by two other French pilots, Le Barre and Durré, in July, 1931. Flying

triangles, cubic feet. Orin, Alaska, their Harrier-Expedition with 600-hp Hispano-Suiza engines covered 5,000 miles without refueling, almost 1,000 miles farther than the Bismarck and Polaris (straight line) New record.

First across the Atlantic when the season for ocean flying spread west, Amelia Earhart pushed, establishing a new trans-Atlantic speed record of thirteen hours, 26 minutes. Not even Earhart's record was broken until 1954, when Sir John G. Wray, known by Motters as "Griffie," cut the trans-Atlantic time to ten hours, 50 minutes. Capt. Willingham von Gronau and three companions carried the world between July 22 and Nov. 3 with no greater margin than his 1934 flight. Sir John G. Wray, who was the first of a breed of warblers. The world's record DeX, which left its Lake County home base in 1951 (during its maiden month trip around the rim of the Atlantic with a twelve-hour, 15-minute flight from Hollywood, N.J., to New York City), was the first transatlantic aircraft to fly from the United States directly to Germany. Jeanne A. Molloy, flying his first Pan Moth from Portsmouth, Irish Free State, to St. John, N. E., accomplished the first solo westerly crossing of the North

Over 600 people, England-Cape route (6,000 miles) only in the year. Maffius flew at a new fast time of four days, seven nights and a half hours. In December Maffius's crew for the trip was not more than two hours by his side. Any Japanese The French pilots were also. Gail here from Le Bourget to Comoros, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 26

[illegible]

Airport development in 1932 was painfully slow but two projects stand out as highly important. Construction at Berkshire Field, Stoneham, La., was virtually completed by the Army Air Corps to accommodate the aircraft wing. Among the commercial fields, in Shreveport Airport, New Orleans, which is constructed on a fill in area off the shore of Lake Pontchartraine.

The Haker-Hirth group in Pittsburgh operated a gliding school at the new county-city airport in Pittsburgh and imported a number of models of the Haker Hawk and Hawk Junior from Germany.

The Glider Section of the Aviation League of Rhode Island trained a large number of pilots and extended its enthusiasm throughout New England via the New England Glider Association. Another very active training center was the school operated at the Warwick (N. Y.) Airport by Warren Eaton, president of the Seawing Society of America. Seawing was accomplished at a number of events, chiefly Flares.

The first successful soaring meet to be held in this country was staged by The Soaring Society of America at Elmore, July 11-24. With most soaring and many entries than ever before and without a single injury the meet marked the advent of a new era in soaring flight in this country. Six airplanes, seven gliders, two two place models and 45 pilots participated in 155 soaring flights from ridges.

At the year closed the Sealing Society was working with Eskimo citizens on a plan for establishing a permanent sealing camp at Etah for the sake of providing adequate facilities for training and for enjoying the most of all phases of the work.

Bottom to top: The Wrights memorial to Kille Beach Whitelabel pressed beach walk; General Seidler's "Quakers" Coast Guard flying boat; America's first radio, designed by Phineas Breenan; custom speakers for 1975 Wilwood OpenCoast; Model B World's Corolla.



The Thirteenth Paris Aeronautical Exposition as it looked to an American

Europe's aircraft industries show their wares

By Edward P. Warner
Editor of Aviation



A general view of the Paris show held in the Grand Palais in the Champs Elysees from Nov. 14 to Dec. 4.



A new variety of French air transportation. The three-point wing design intended for military service.



Another latest type exhibited in the 1933th 17th exhibit. The engine is rated at 150 hp and is equipped in service about 1933.



Below: Both ends are seen in the molecular model of the hydrogen atom ground between parallel plates. This is typical of European practice. Below: The latest version of the Renault "10 road" 1933.



Airplanes in Paris

IT IS impossible to compare the Salon Aeronautique with an American aircraft show, for they exist in a wholly different atmosphere. The Salon has three essential objects, and the sale of civil airplanes to private owners or to corporations is the least of the three. The first purpose is to show the sturdy and conservative, but down-to-earth, people of France what they are getting for the slightly more than two billion francs of their taxes that annually pass through the hands of the Air Ministry. The second is to display military planes to the representatives of a dozen countries that have no important aircraft industries of their own, and that send their officials to Paris to look over the ground for their next orders for air force equipment.

There, obviously, was the motive for the participation of three British and four Italian aerobics manufacturers, and American builders of military aircraft ought to give very careful consideration to the possible advantages of taking a place in the Grand Palais for their own products before the next Salon is once again open.

Before looking for specifics in detail as I walked about the Grand Palais, I looked for novelties in general layout. I found two that seemed important,—a

tallies Nieuport and the latest one in autogiro, sponsored by Lecoq-Olivier and developed under the direct supervision of Captain Leprieux, well known in America for the time that he spent here during the War and for the planes that were built from his designs at that time.

The tallies wing machine is a return to an old love, as Nieuport built under license the first of all tallies ships, the Duxmo, before the War. Not very different in general from other tallies machines of recent vintage, such as the 110 (Pierrefort) and the ship built by Leprieux in Germany, it has flaps that serve both as elevators and ailerons, and a three-point landing gear, somewhat similar in principle to that of the Ford Sky Car. The autogiro is small for a tallies plane, and in fact the trailing edge is almost straight, the wing being slightly tapered in chord.

Something new in "gives"

Of greater immediate importance was the new autogiro, the first adaptation to commercial form of De La Cava's recent research work of which combined results have been reaching America. As compared with previous autogiros,—the Pliant and Koller models, for

example, the new machine differs in having no fixed wings, no ailerons or elevators, no struts on the rotor, only three rotor blades, a pylon with only two uprights and a couple of wires for lateral support, and a "mushroomed" "safety" or safety of blade area to areas of the swept disc. Obviously, the new structure is much simpler than the old. There is a fixed horizontal stabilizer, which is attached to the engine and turns with it, but elevators and ailerons are replaced by a controlled thing of the rotor unit. The extreme angle of tilt is some 10 deg. The rotor blades are rectangular and may about 9 ft. wide, giving a solidity of less than 0.5, as against the 30 which has been common practice in the past. The general appearance is very neat; the control mechanism is simple, a closed cabin with two persons side by side, the weight is 550 lb. empty and 1,000 lb. loaded, and a 75 hp engine is reported to give a maximum speed of 100 m.p.h.

Turning to the airplanes, as far as the French industry can be said to show any general level of its present state, the current mechanical design, a closed cabin with two persons side by side, the weight is 550 lb. empty and 1,000 lb. loaded, and a 75 hp engine is reported to give a maximum speed of 100 m.p.h. Turning to the airplanes, as far as the French industry can be said to show any general level of its present state, the current mechanical design, a closed cabin with two persons side by side, the weight is 550 lb. empty and 1,000 lb. loaded, and a 75 hp engine is reported to give a maximum speed of 100 m.p.h.



The new wing engine of the Wibault high-speed transport are mounted directly in the rear of the wing chord.

industry to pay decent attention, were:

1. The use of very high aspect ratios, both on wings and control surfaces (Wells has particular possibilities in metal-covered transport planes and wing-root boosters).
2. The use of a single main spar, or of two spars built together into a single box beam.
3. The use of flaps to lower the landing speed and act as a brake.
4. Gross application on fields of vision, and the development of definite quantitative means of revealing them.
5. The biggest type of fuselage trim (the most effort is secured by slightly different means in certain Fokker machines) to improve vision and field of fire to the rear in military planes.
6. Extremely deep housings of good aerodynamic form.
7. Elaborate systems of windshields to protect the rear gunner.
8. The Hawker system of construction, applied to single-engine fighters.
9. Ultra-wide landing-gear tracks on small machines.
10. The Hissler type of quick-detachable wing indicator.
11. The general use of ground engines.

Some of these features are applicable only to a few types of airplane. Some of them might prove not at all applicable at the United States. But they are all worth looking into with an open mind.

Engines

The engines at the Salon, like the airplanes, contained many details of great interest, and indicated many complete designs of demonstrated merit. One of the airplanes that they left at American exhibitors with the conviction that his own country stands well in the front, and quite capable of meeting any competition.

The most prominent trends in European engine design seemed to be: a renewed and growing popularity of water-cooling; a widespread use of ground superchargers; and the habitual power rating of all military engines at a low, reliable altitude rather than at sea level; the general use of reduction gears; an emphasis on tremendous power, standard largely by the build-up of special reduction gears; the Schneider Trophy success; a disposition toward engine mounting at a very high rotational speed, developing a very high power per unit of piston displacement (this again is at least in part the product of the rules of special competitions); the use of water-cooled engines of great capacity of small displacements (as many as nine in one row); the introduction of a number of W engines; the coming of new diesel, much-improved flaring of the exhaust cylinders; the general use of air starters; a growing popularity for engine-in-ship plans, both cast and forged.

The largest stock engine shown was

the 1,000-hp. Hispano-Suiza W, fitted with new carburetors and reported as weighing 1,500 lb. Across the perimeter of the section for wooden propellers, already mentioned, it was interesting to see that most engine develop a propeller hub of the type forming a dome shape, some 14 in. in diameter and about 34 in. long.

Though the Hispano was the largest of the stock engines, several competition models were designed to give much more power. Renault showed an engine designed for the 1933 Schneider Race, which produced 2,000 hp. at an level and had a supercharger using of 21 in. diameter with two 4-in. pipes leading the charge from the supercharger to the cylinders.

France displayed a similar specially supercharged design. Most spectacular of all, of course, was the Hispan 2,800 hp. Fiat, with two engines placed side by side and the power from the rear one taken off at the rear end and brought forward through a shaft running between the cylinder blocks and through the middle of the hollow propeller shaft carried by the gear drive of the front engine. The two shafts are then connected, running in opposite directions, and carry separate propellers running in tandem in planes about 8 in. apart.

The Deutsch Gp. the most important French stand-out of the next year, is limited to planes with engines of far more than 4,000-hp. piston displacement, and so far its designers take that as their only criterion. It will of course have the same effect that limited-displacement automobile racing has had on engine work, to wit, a great inclination to crumpe speed and in the next power output, but with little or no change in the weight per horsepower. The loss of the engines designed specifically for the Deutsch Race was shown by France at the Salon, and 500 hp., or more than 1 hp. per sq. in. of piston displacement, was provided. An engine in another remarkable design of a somewhat larger type, was displayed by Delage, famous builder of racing cars.

The 270-hp. reduction gear of the Delage was paralleled on a number of other engines at the Salon. The general tendency, both in England and in France, is toward reduction at a considerably larger ratio than is common practice in America. Most of the reduction gears are of the offset type, with the shafts in line up above the crankshaft, but a few, notably the Bristol, stick to the level gear transmission with its crankshaft and propeller shaft in the same line.

It is impossible to say much about the three air engines at the Salon, for two of them were shrouded in complete mystery. The third, appearing under the trademark of C.M.I., was the Junkers double-ported piston design, built in France by Peugeot, developing 800 hp., supercharged for constant

power to 15,000 ft., and running at 1,800 r.p.m. Total weight was 2,250 lb. per hp.

The other air engines were the Claret design, built by Hispano, and the new Lavasine. Both being extremely fresh, little structural detail was apparent except that each had two main gas cylinders, and that the Hispano-Claret was built both in cast-iron and in cast-steel cylinder blocks, giving around 380 hp. and 550 hp. respectively, and weighing 22 lb. per hp. Separate pumps were used for each cylinder, with a nice device controlling the pump order in the manner of the Fordham and the Hispano had, for some reason, two pipes running side by side from each pump to its cylinder. These two engines are undergoing extensive testing by the French Air Ministry, but are probably hardly ready for commercial use as yet.

No description of the Salon could be complete without mentioning its extensive display held open French interest, and especially upon the French press. Various papers, with no special astronomical interest put the show upon the front page day after day, and L'Espresso (the first spring-day, gave it at least three columns every day throughout the two weeks that it lasted. Most remarkable still was the publication of special summaries of practically all of the first-class observed shows in America were to be attended by the appearance of national assistants at the *Grandes Revues*, Paris, London, Coblentz, The New Republic, and The Times of London.

It is difficult to put the right of an occasion on paper, but I must not close without paying tribute to the quality of the management and to the courtesy with which visitors were treated. Apart from the exhibits that I mentioned, the artistic sense of the show and its efforts in attracting favorable public opinion reflected great credit on Henry Dore, president of the French Aeronautical Chamber of Commerce, André Girard, long the chamber's general manager, and on its other officials. As one of those who enjoyed the visit to the Salon the more because of the thoughtfulness and the attention of the show officials and of many of the exhibitors. I can express the hope that there may be many more American spectators at the next Salon than at this one. Even though he might come home fully convinced in his pride and confidence in the products of his own industry, it would be well worth a visit for every American manufacturer of aircraft to go to Europe at least once in four or five years and to see how other people are meeting progress that have much to come with it—and he will be well advised if he plans to go at the time of a Salon Aeronautique in the Grand Prix.



Orange lettering and the wheel S.A.C. monogram in gold identify Transamerica Airlines' mail and passenger ships.



Wings around the Western Hemisphere in the theme of the American's machines.



Ludington airplane colors and its name over an arrow which runs the full length of the fuselage.



Golden wings on red, white and blue prominently shows north Northwest Airways' address.



The Boeing "log" is a part of the standard United Air Lines marking. Visible in the windows between Chicago and San Francisco.



The simplicity of plain letters maximizes the identity of Transamerica and Western Air's planes.



A white eagle and red wheels identified in a one-headed white chevron from the official insignia of American Airlines.



The black and gold arrow and winged lightning bolts on Eastern Air Transport's planes.

Labels

Distinguishing markings on American airlines



Another variation of the United insignia. The arrow-pointed "NAT" is also used there, but on the wings at the main entrance.

Backed by two years' experience, a prophet again looks into the future

Estimate of the situation for 1933

By Edward P. Warner

Editor of AVIATION

FOR the third time in as many years, I undertake to prophesy the events of the year to come. It was with unusual confidence that I prepared the first of these personal forecasts. To make precise estimates for one's own future, or to share them with one's friends, is a hazardous pursuit, but the state who ventures to put his forecasts into solid type, and so permanently on record, runs the risk of making himself the laughing stock of an industry of his own time.

But now I am growing bold. The forecasts of the last two years have had some measure of success, and in certain respects have turned out to be very close indeed to the truth. It is with some little optimism that I set down in glass upon the crystal globe and in wet ink on this page the forecast for 1933.

No one would be justified in finding satisfaction with the accuracy of a past forecast, or confidence in the usefulness of a future one, if it were based upon pure guesswork. There would be some opportunity in the process of prophesying, if it depends to a large extent upon the workings of human nature and accident, but inaccuracy may be reduced to a minimum if we stick close to the facts for guidance. There is no delusion here in forecasting the airplane market, nor the future of transport operation in a coming year, but there are certain factors which we know to be important, and which we can definitely determine. Presently they do not change already, and the trends of the immediate past, with appropriate allowance for new or modifying influences, can be used for interpreting the immediate future. If we proceed methodically, taking into account all of the facts and statistics bearing upon the present position and following the line of logical expression, we may not be perfectly accurate in our predictions, but at least we may be sure that they will be absolutely at variance with natural law.

We are at least sure upon saving ourselves from such unscientifically circulated claims of the prophets or the economically imprudent in concentrating a good deal of the astronomical prophesying



"What man who ventures to put his forecasts into solid type runs the risk of making himself the laughing stock of his industry if he goes thus badly!"

done in the halcyon days of three or four years ago.

Transport continues to grow

Again, at last year, transport operators deserve first consideration. In 1932, for the first time in the history of American aviation, the total receipts of the transport lines have exceeded the total costs of aircraft and engines, discounts, fuel, repair, military and non-military. For 1933 I anticipate that transport revenues will exceed the total of equipment by about 30 per cent, and that they will actually exceed the total of all income received by American aeronautical enterprises from all other sources combined—manufacture, operation of schools, aerial photography, landings, and all the rest. Already the transport lines have a total revenue, as-a-whole, as large as that of all the other lines which operate between American cities. Whether in comparison with other aeronautical activities or with other classes of transport, air transportation has steadily increased its relative importance.

Last year's transport interest turned out very well indeed. In fact it proved to be almost too good, upon the principle that a 30 per cent rise in a highly doubtful figure may indicate good calculation, while a 6 per cent rise simply shows good luck. Predictions of 48-100,000 miles of transport flying and of 130,000,000 passenger miles came out within 2 per cent and 6 per cent, respectively, of the true figures for 1932. Only one air operator had the fortune to get all wrong, for the percentage of express handled has fallen about 24 per cent below the prophecy.

A large part of the mileage is of course efficiently freed by the air mail appropriation. In new airports, if Congress will only leave the budget undisturbed, that that will run a little above the level for 1932. At the present time air mail operations are at an average rate, allowing for the normal percentage of loss, not more because of impossible weather, all about 30,000,000 miles a year. Allowing for second systems or additions to service, I anticipate a total of 30,000,000 miles flown with mail in 1933, including both the domestic and the foreign routes.

The mileage without mail is more difficult to predict. For the past year it has been about 14,000,000, but approximately 10 per cent of this mileage came from lines that suspended operations during the year, particularly Century and Century Pacific. For next year I do not anticipate, unless there should be a much more rapid recovery than it seems to be able to report, that many new lines will be started. At the end of 1932, the scheduled rate of operations without mail is 11,800,000, with the appropriate deduction for collapse not flown in account of weather, and I predict a total non-mail operation of 11,800,000 miles in 1933. The total is all stages of service would then be 43,800,000 miles, approximately 4 per cent higher than for the past year ending.

The total amount of traffic, however, should show a gain of considerably more than 4 per cent.

During the past two years the average number of passengers carried in each

plane on non-mail routes has considerably exceeded the average on mail routes. With the growing popularity of night flying of passengers, and the fact that it is not yet possible to adjust mail schedules and conditions of mail-route operation to the convenience of passengers, I expect that statistics to come in as well. During the first six months of 1932, the average number of passengers per plane was 2.5 on mail-carrying services, and 3.8 on those without mail. Both domestic and foreign routes were included in calculating these figures. For next year I predict an average of 2.5 passengers per plane on all routes. They will give an 17,000,000 passenger-miles for the year, an increase of 25 per cent over 1932. I do not anticipate any further increase either in passenger miles from the established level of about 6.2 cents per mile and the total passenger income of the lines should thus have around \$5,000,000 in 1932, to approximately 11,000,000 in the coming year. Taken with no air mail appropriation of \$37,000,000 (domestic and foreign combined), an amount by the budget, we have in prospect a gross transport income of a little more than \$38,000,000, the little more representing whatever air express may contribute.

Air mail expectations

To prophesy on the amount of air mail that will be handled is perhaps an important thing. Since the Wilson Act became law, the amount of money that the operators derive is determined more by the appropriation than by the number of letters sent through the air. There has, of course, been a loss of air mail in the past year, but it was not an especially large loss, due to the reversion of certain transcontinental mail so that it was carried into schedules previously it had been carried there with the express. This week ended in January. Up to that time, though the figures do not show it, the amount of air mail carried in 1932 was roughly about 5 per cent above 1931. Since that time the true figure has been off about 20 per cent from the previous year.

For 1933 I expect the mail percentage to run about 20 per cent below 1932 through the first six months, and about 5 per cent above through the last six, giving an approximate 2,000,000 lb., or against 7,500,000 in 1932. Notwithstanding the terrible economic collapse of the last three years, however, the postal establishment has 60 per cent increase in air mail rates, the amount of mail handled with all stand well above the 1932 level.

Of course the estimate just given is based on the assumption that air mail rates will remain where they are now. The Postmaster General has recommended a decrease in first-class postage rate in the old 2-cent figure, and if Congress agrees to that he will pro-



"It seems that if the air transport industry is of more importance than it is, it is a pity of 40 per cent."

visionally cut the air mail back to the same rate as the cable rate. In that event, the total of air mail percentage ought to be around 8,500,000.

Express traffic has been left to the air, but only because it is at the present time the least important of air transport sources of revenue but also through a desire to get the comparatively easy jobs out at the way first. The practice of express traffic is to single out jobs, if it depends, perhaps more than other passenger or mail business, upon the general state of the economy. It depends also upon the number of specialized express services that are operated, upon the energy and ability with which they are sold, and upon purely psychological factors, which are the most difficult of all to forecast. Undoubtedly a great deal of matter has been sent by air, and will be for the next year or two, partly for commercial reasons and from motives of publicity. Truly economic traffic is always slow to develop on a new service that is the

slowly and temporary type. As new air mail services always get a deal of business on their first run from stamp collecting, so new air express services can count on a certain amount of temporary support from shippers who like to be distinguished in the art of handling a parcel to the office. How long it will take before we pass completely out of that stage, and before air express has settled back into its permanent state of graded growth and of a scale dependent on shipments that really gain enough advantage from going by air to make the added expense permanently well worth it, is anybody's guess. Some lines, of course, have been in the business so long that they have emerged from the spectacular stage completely. The present indications are that about 1,500,000 lb. of express will have been flown in America this year. For 1933 I set it at 1,800,000 lb., a gain of 40 per cent. That ought to add about \$200,000 to the revenues of the lines.

The temptation is strong to try to anticipate the rate of air mail percentage past beyond 1933, but it cannot be done with any safety. The dependence upon governmental reference is too great. I can only say to believe that if the present methods of negotiation and the present handling of the air mail are continued, and if we begin to make some headway out of the general depression within the next year, 1935 will be a year of very rapid advance in air passenger business. On these conditions I should expect the next two years to go into shattering down the new equipment that is now being developed and introduced, and into the continued study and introduction of new equipment. I expect very rapid headway during the next two years in overcoming that public opinion and skepticism which still dilly air transportation, and which, partly for commercial reasons and from motives of publicity, truly economic traffic is always slow to develop on a new service that is the

Aerial service and schools

The position of fixed line operation between air operators has been quite shrewdly shown this past year, and last year. I am unable to say very much more for now, however, in that field. The long-range prospects for aerial photography continue excellent, but the general depression of land values makes it extremely difficult to get any private contracts at present. Aerial advertising is a new and growing field, which has had a special stimulus from the introduction of the enterprise, and it should do better in 1933 than in 1932. Many operators feel that the two-figure rate having all built, and that is no early prospect of the reversal of the decline.



"It seems now exceedingly likely that, for the first time in these years, the prediction is that the bottom of the trough has been reached, and in its descent as an increase in production for the next year."

best result of the sweeping up of all these is that the amount estimated for the direct payments of rental aviation is \$24,540,000 as against \$22,856,000 this year, while the Air Corps gets \$26,413,000 as against \$25,430,000. The total difference for the two services will be increased by 4 per cent, or against a decrease of 20 per cent this year below the previous year's figure. It is with great relief that one sees that the budget estimates have realized that such drastic reductions cannot go on indefinitely, in spite of the need for economy.

Air mail service

Though the manufacturers of airplanes and engines naturally have their attention focused periodically on the military and naval portions of the budget, they must keep a close watch on the Post Office appropriation as well. The demand for transport planes for government during the next year is a very pressing one, but it will depend largely upon the mobility of the relations between the transport operators and the government. For the operation throughout, at least, of the contract air mail lines and those for the Department of Commerce work on always are all dependent.

Here again, the estimates give relatively little of which to complain. In the face of a 10 per cent cut in the amount to be expended for the railroad transportation of mail, the amount allowed for domestic air mail was increased 3 per cent over the first year, to \$19,646,000 as against \$18,000,000. With a steadily increasing service to the government from the service, the Post Office deficit on air mail should be less than last several years. The explanatory statement attached to the budget notes the Congress that there is no plan for extending or extending the present air mail service, and that the proposed increase of \$14,000,000 is merely to keep existing routes going. Unfortunately the House Appropriations Committee previously bracketed off another \$1,000,000, bringing it down to \$18,000,000, so the operation here at least cut more of those drastic cuts in rates of payment of which there have been so many in the last two years.

Private air mail continues, for the current year as for three years past, at \$7,500,000.

Darkening the skyways

So far, so good. Or at least comparatively bright. It is no tasking to the Department of Commerce that we really begin to get the sky. For four years the Air Corps Division has been engaged in building a system of airports and radio-aided airways which were a series of half-finished jobs in aviation circles, and of only in the rest of the world. This year, for the first time, the process

of building has been stopped. The survey system has become static. Next year, under the present estimates, and unless Congress does something about it, will be for nothing. It is still only a *proposed* survey system. Current estimates provide for building of the light on 1,500 miles of survey, or about 10 per cent of the total. The explanatory statement submitted with the President's message emphatically puts it that three airways will be "improved in private style (or day jobs)." That that really means is that their distinctive quality as airways is to be destroyed. If we had only day jobs to make up with, we should hardly have needed the development of our airway system at all.

In terms of figures, the amount estimated for the survey work was only \$5,550,000, a reduction of nearly \$1,000,000 from the estimated expenditure at the present year, and of almost exactly \$4,000,000 from last year. The fiscal year 1934 (that beginning on July 1, 1933) will show a reduction of 22 per cent below 1932.

There is another side to the figures, it develops that all operating costs, such as fuel, electricity, and telephone service, are to be reduced 3 per cent over the present year, while the total of salaries will have to come down about 10 per cent. The explanation in Washington will fortunately be left unmentioned, but there will be a cut in the number of the Airway Division will be reduced from 2,527 to 2,182. A number of radio electricians, for example, will be cut from 25 to 7, the number of senior radio operators from 267 to 211; and the total number of wireless operators, including radio and telegraphers, will be cut from 1,000 to 861. With 400 wireless left, the maintenance of present equipment is a considerable job, with truly antiquated air navigation will be no longer feasible.

Regulations

The allowance for the regulation of airways will be increased approximately at the present level. It suffered a very slight cut last year, about 20 per cent, but the reduced amount of design, production and operation during the depression has lightened the burden on the Aeronautics Branch, and made it possible for them to carry on without showing any reduction in making to transfer their class to private agencies. Presumably that work will go forward next year in the same way, with a total of \$1,100,000 or more to cover the cost. The increased number of regulations in the regulatory work is to be 284, the same as during the present year, involving 90 inspectors, of whom fifteen spenders on the streets and five on the roads.

In addition to all the other benefits that the aircraft industry gets from the

Department of Commerce appropriations, it receives direct income from the sale of a new airplane each year for the use of the department's personnel. For next year the amount available for that purpose will be about \$95,000, or against \$100,000 this year.

Less money for weather

The story of the *airways* is only partially told in the Commerce section of the budget. To complete it we must turn to the Weather Bureau, which comes under the Department of Agriculture, and look for the allotment for meteorological and navigational work. There again the savings process to have achieved a serious loss.

The expenditure for collecting weather information and distributing it for aeronautical use has been cut for the last year from \$1,555,000 to \$1,455,000. Now the proposal is that for next year it shall come down to \$1,345,000—a change that will require a saving of about 30 of the 450 meteorological and navigational units have been doing the survey for the last two years. This is, of course, a very serious loss, and the proposed decrease in the appropriations for the service themselves, and the operation of aircraft can only help that Congress will find some way of meeting money standards in terms of reducing it at this point, where it is so badly needed.

For weather in the Coast Guard there is no specific estimate for next year. Maintenance and operation of planes already in the service are estimated to be the general appropriation, but there will be no money for new purchases. Last year \$100,000 was obligated for new ship equipment.

The finally eye with which the budget officials have regarded research work in the Army and Navy has extended also to the Weather Advisory Committee for Aeronautics. The Bureau of the Budget and the House and Senate have shown themselves previously sympathetic to the Advisory Committee's claims, and well aware of the importance of its work, as an independent organization over the past few years. It is a strange anomaly, however, that the President on the very basis of a Budget which shows by its liberality the confidence that the committee commands, should in a message recommending the committee's virtual abolition. The estimate for next year calls for \$445,000, or about 10 per cent less than the estimate for the fiscal year 1933. Increased is scheduled to continue at 312 at present, about 90 per cent of these being attached to the staff of the Weather Bureau's Meteorology at Langley Field. If the Presidential recommendation for transfer of the committee's work to the National Weather Bureau is through, however, there is no telling what may happen.

EDITORIALS

AVIATION

EDWARD P. WATKINS, Editor

Creed for the New Year

WHEN President Hoover faced the problem of drafting a Thanksgiving proclamation for 1932, he met with an issue which may have presented more difficulties by going back a hundred and forty years and reviewing the first proclamation of the first President. That might not be a bad idea in preparing a new-year message to the aircraft industry.

It would do us all good to look back to 1913, and to remember how similar were the issues with which the pioneers had to operate. It will help to rebuild sagging spirits if we look back to 1921, and recall the seemingly insuperable difficulties of the post-war deflation of military activity and the failure of commercial aviation to materialize on schedule. There are now and in the business who have tried personal recollections of both of those periods. Aircraft enterprises and aircraft operations, such as they were, came safely and securely through their former tribulations. They will come safely through again.

THERE is no one blinking the fact that there are tough times. The period when we can depend on liberal doses of optimism alone has passed. It would be extremely foolish to try for as artificial cheerfulness which would blind us to everything that goes on about us. It would be even more foolish to neglect the bright patches in the scene, or for any important direction of the industry to admit that it is bleak.

So far as air transport is concerned, of course, no question arises. Air transport has accomplished the truly phenomenal feat of making steady progress in defiance of the depression, but other aeronautical activities have not done quite so well, and it is there that the need for perspective and sober judgment in the present situation is strongest.

The lightest spe of all as we look ahead is in the conviction that we have definitely passed beyond Government appropriations for the purchase of aircraft. It is a sad fact that last year's, and the pressure of replacement demand on private planes and those

owned by civil services grow higher with each year in which practically no replacement is made. Elsewhere in this issue we have analyzed in detail the demand for 1933 and the odds' ratios for outweighing that it will exceed that of 1932 on almost every count. General business and the stock market end the year, on the whole, at levels not far from those at which they began it. Political tension in the national government is relaxed for at least a year. We cannot say just when the process of rebuilding will definitely start, either in the aircraft industry or elsewhere, nor how rapidly it will go forward, but there is an encouraging body of evidence that the process of reconstruction has reached an end.

TO REBUILD in the field of aircraft manufacturing requires two things: The manufacturer must have a product, and he must sell it.

The first condition of staging is business in that engineering must convert its main program. No one is going to replace a 1930 airplane with a 1933 airplane that looks just like it. In the past three years there has been spectacular progress in transport design and in military design. There has been nothing in proportion in detail in some of the smaller commercial airplanes, and a few completely new designs of great interest. On the whole, however, the smaller civil types have shown disappointingly little change in three years. If any faithful follower of AVIATION who has preserved his copies will turn back to February, 1930, and read our report of the St. Louis Show, he will find that a number of planes displayed there have an extraordinary resemblance to the present day models.

THE first condition in creating a replacement demand is to make a change. As a general rule the change represents a clear technical improvement, though in some instances a simple change in style will be made where no technical advance is available. We shall not pick out any single quality that seems to us to call for improvement. The present day airplane is an admirable product. One cannot put his finger down upon it and say that it needs to be faster,

or more economical, or more reliable, or improved in any other special characteristic. It does, however, definitely show improvement somewhere, and it needs to be seen external evidence of improvement, for the frequent introduction of change is the first law of continuous production in industry. The 1932 show in Detroit looked altogether too much like that of 1931. The next show, wherever it may be held, ought to show a distinctly new line of products. No one could possibly mistake a 1939 automobile for one of 1932 vintage. It ought to be just as impossible to confuse an airplane of 1931 and one of 1935.

Having met the basic requirement of technical development, it remains to sell the product. Sales effort today is too generally dormant or reduced to casual personal contacts. There will be no satisfactory improvement in the sale of airplanes until the means of newly-produced types are put before present owners and potential purchasers through every possible medium of publicity. There is still business to be had. There is not as much as there was once, but there is still enough to strive for. If the aircraft industry, including the airlines and the small service operators, will enter the year 1939 with a firm determination that the turn has come, and if they will remember that the world was not created in 1927, and that they and their predecessors in this particular line of trade have known harder times in the past than any that we are being experienced ones, there will be no doubt of their ability to bring about an improvement in the present state of affairs.

Consider the prior art

LET US begin with a platitude. There is nothing new under the sun. That being said, we can get down to business.

Not long ago the head of a research department of a great industrial organization remarked that two-thirds of all the problems referred to his division for solution could be reversed without doing any research anywhere except in the library.

This position was not unique. It happens with ludicrous frequency that the "new" idea arising from the sweat of the inventor's brow have been tried out and have worked or not, at the time might be, anywhere from two to 25 years ago. Every engineering department could well afford to keep at least one of its members busy studying the history of airplane design. That is a function which is usually relegated to the patent counsel's office, and it is carried there only for the purpose of proving that somebody else's invention is not genuinely new, and can therefore be used without financial recognition. Technical history is even more unfairly employed in connection with one's own idea, not only to find out whether or not

they are new, but also to gain inspiration for new lines of thought and development.

NO QUESTION of sentimental desire to keep alive the memory of the work of the pioneers is involved here. Upon purely practical grounds, as a device for saving money and increasing the rapidity of new development, the study of technical history is an immensely profitable investment.

Furthermore, while we are on the subject, let us remind ourselves that all the arguments in favor of a study of the prior art apply also to the study of current practice in other parts of the world. Nothing is more extraordinary than the degree to which engineers and their industries are often content to sink into a complacent isolation in groups well off as national lanes. The olive of *Aviation* has just returned from a tour of Europe—a very pleasant and a very profitable one. Like previous explorations on the same continent, it revealed that although there are a great many people in the European nations who are deeply interested in American developments, there are others who join in by with a placid scorn. Their scorn is not reserved for America. They apply it equally to each other. Within the past few weeks we have been told by gentlemen of distinguished positions in the aircraft industry or the air transport operations of no less than three European countries that it was perfectly axiomatic that their design or construction of aircraft, or their operation of lines, as the case might be, was so far ahead of everything else of the kind in the world that they had nothing to learn from abroad. They were not talking in the hope of getting favorable publicity in *Aviation*. They really believed every word of what they said, but it would have been much easier to feel assured by their explicit confidence of their own superiority if we had not had such a clear indication of having heard exactly the same sort of thing from considerable numbers of Americans.

LET US give but four examples to prove our point. Let us and we will scatter them as widely as possible.

Airplane lenders burst upon the aeronautical world with the shock of complete innovation in 1936. Yet six years earlier there had been built a number of commercial airplanes with excellent bodies, and for some years before that there had been somewhat inferior ones. Then the idea of lenders had died out for no apparent reason, but the experience was there waiting to be recognized, and the development was waiting to be taken up again by anyone who took the trouble to read the record.

In 1925 and throughout builders of aircraft were very much concerned over the possibility of using enclosed cockpits, especially on transport machines. There was a great deal of speculation about the possible effects upon the pilot's flying judgment, and widespread conviction that enclosed would be definitely

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disastrous. Yet in 1930 the Army Air Corps had had several machines with enclosed cockpits, including one transport type which had been flown by a number of pilots under all sorts of conditions, and at least one enclosed machine had been the subject of extended trial as far back as 1912. When the subject became a lively one again in 1926, some slight attempt was made to draw upon that prior experience, but on the whole it received only the most fleeting attention.

SO MUCH for instances of what could be learned from the prior art. Now take a look at what one country can learn from another.

The welded steel fuselage came into use in the United States about 1922. By 1925 it was almost universal in American aircraft. Yet the development of all European governments except two or three, was to consider that welding was an uncertain and a dangerous process which they could not tolerate. The fact that hundreds of welded fuselages had been built in America and in Holland and operated over a period of years without failure, left engineers and regulatory authorities elsewhere quite untroubled.

Now take a case from the other side of the ocean. The oleo gear began to come into use in America in 1922. Within a couple of years thereafter it was generally hailed as the only oil shock-absorbing mechanism, and it was going on to meet most American aircraft. Yet the use of oleo struts had been common practice in certain European countries, especially in Great Britain, for four or five years previously. We on this side of the Atlantic never didn't know or care. There are but four instances, chosen at random from a gross number in the past. Unless we learn the lesson that they teach, there will be a gross number of others, with a dissipated waste of time and waste of money, yet to come in the future.

Hiram Bingham

THE VOICE of the people, dissenters are fond of repeating, is the voice of God. We are not such uncultivated admirers of democracy as to believe that. We know that votes have often made blunders. The voters of Connecticut made one on Nov. 8.

Senator Bingham's successor may be admirably qualified to sit in the United States Senate. He may be as amenable to that body and to the Commonwealth, but we do not believe that he can replace Senator Bingham. From the aeronautical point of view, Hiram Bingham's name cannot be filed.

His efforts in his state have been many, but for the moment we are interested only in what he has done far afield. He came to the Senate in 1935 as one of the very few members of Congress who knew aviation at first-hand, both in theory and in practice. He

was the lone representative of the Senate upon the Morrow Board, and he was one of the two or three members whose prior experience of the subject concerned with their casual gifts to make them most service in the work of the Board, and at once most understanding and most helpful in the interrogation of witnesses. He turned to unremitting advocacy of measures for governmental standardization and proper governmental supervision of civil aviation, and it was pre-eminently through his efforts that the Air Commerce Act of 1926 was passed in the Senate and that various perfecting amendments have been accepted in the last few years. Aeronautical interests had been urging the passage of such legislation for at least four years before they got it, and they had made scarcely no headway at all. To remove the debt that we owe to Senator Bingham and to the other members of Congress who worked with him to set up the Aeronautics Branch, it is only necessary to think of the chaos that have resulted if the house of 1927 had come upon us in a total absence of legislation. It might well have done so, and aviation would have received a blank eye from which it would have taken many years to recover, and would have become the victim of a welter of hasty and ill-considered measures pushed through 48 legislatures under the influence of panic. The Department of Commerce has saved us from all that, and it was Hiram Bingham and a handful of senators working largely under his leadership who put the Department of Commerce in a position to do the work.

IN the past five years the Senator from Connecticut has kept close contact with our aeronautical appropriations, he has repeatedly defended the Navy's airplane construction program against undue and dangerous attacks, he has published the summarized work of the government and of the industry before a hundred audiences, and he had a campaign which resulted in the appointment of a special joint committee of Congress to clear up the aeronautical relations between the Army and Navy and to define the place of aeronautics in the defense of American shores. That the joint committee was stymied and strangled by official non-cooperation must remain a source of lasting regret, but at least the attention of Congress had been directed to the subject.

We refer only to the Senator's official activities, for it is those that have been scrutinized, or lit as we hope that we may say rather mildly interrupted, by an electronic instrument at his own instance. The somewhat weak and feeble State of Connecticut has seen the services of Hiram Bingham—explorer, teacher, scientist, statesman, publisher, airplane pilot, aeronautical enthusiast of the first water whose enthusiasm has always been guided by common sense. We shall miss him badly, and we look forward to the time when his participation in the control of government policy may be resumed.

Tackling the task of raising an armed public, the Newark Museum is presenting a survey of the history, engineering and industrial aspects of aviation. Two completely independent planes, a B-24 transport and an old 1920 Curtiss "pusher", a group of aircraft engines including both current and historic types, a wind-tunnel which visitors can operate, demonstrating the principles of lift and air flight, weather bureau instruments in operation, and the receptors of radio location and weather reports, construction exhibits of wings, fuselage, etc., and a map of routes of all airlines and flying prints \$3 for two hours.

The aeronautical industry, as represented by 17 members of the Board of Governors of the International Chamber of Commerce, wants to show its position during the coming year. At a special meeting on Dec. 12 the Board unanimously expressed the opinion, urged unanimously in Amsterdam, that the financial state of the industry and limited market in prospect for 1953 is not a very bright picture, the elimination of all possible expense.

Reforms for Brazil

Following up its practice of two Decemblers last October, the Brazilian Government has ordered its own plans of that type from the Reforma Aeronautica Corporation. They are intended for photographic work, as the Army Air Service will not cost about \$250,000. Orders for Brazilian planes were also sent recently by two departments of the United States government. A Wage-powered Skyrocket, with major modifications from commercial specifications, is for the Air Force. The Personnel and the Wright Whirlwind Series E engine, ordered by the Aero-

nautics Branch, will bring the Reforma Corporation in the Department of Commerce fleet up to eight planes. Airplane and parts manufacturers who would be interested in the sale and in service developments and representation had opportunity in the person of Captain W. H. Hooton who is at present in this country. Reforma Aeronautica, a company, which is a director, is an official trading company and medium for the development of the Brazilian market.

Further advance into the foreign field has been made by the Edward G. Buhl Manufacturing Company of Philadelphia, a business organization which is that already visited with the Indiana Service firm has been registered with the French aeronautics manufacturers. Henry Rott, for the use of the "Shannon" process, and aviation steel construction. The airplane built by the Buhl Company last year and sent to Europe for demonstration purposes, was on the wing during the recent aeronautical exhibition at Paris. Paris is at the moment the most active of French manufacturing, with over 3,000 employees on its list.

Standard steel work is also a strong point with New Standard Aircraft, Inc., which recently received an experimental contract from the navy for wing braces on the patrol boat PK-1. New Standard presents another instance of an organization rising from the ashes of co-operation under the banner of its former employees, who purchased its assets and reorganized the old firm.

While members of its first school and service at its Valley Stream Airport to Suffolk, Inc., Curtis Wright Aircraft Corporation, one operator of 20 planes, which is now being completely retired from the operations field. In the future it will concentrate on airplane sales and services. At Valley Stream, a Washington School will be maintained. Curtis-Wright flying services at the Boston Municipal Airport have been merged with two other commercial aviation companies operating from the field to form Aero-Boston, in which it holds a one-third interest.

Reforma Aeronautica Corporation will be a company manufacturing, aerial surveying and airplane sales subsidiaries have transferred their respective assets and factories to Woodside, Long Island.

Corporate earnings

Beginning with the financial reports for the third quarter and last nine months of this year is made by United Aircraft and Transport Corporation. Its net income after taxes, depreciation and minority interest amounted to \$177,368, equivalent, after deduction of requirements for preferred dividends, to 36 cents a share on 2,004,780 shares of preferred stock, this is an improvement of one cent a share over earnings for

CLARENCE KIRBY VANCE, 48th ranking as mail pilot in the country and airplane designer particularly known for his flying mail delivery service, was killed on Oct. 17 when the mail plane which he was flying crashed near the summit of Rocky Ridge near Danville, Calif.

the corresponding quarter of 1951. For the nine months ending Sept. 30, 1952, it had total \$1,671,465, 36 cents a share on outstanding common stock, as against 88 cents a share last year when profits were \$2,390,673.

National Air Transport, a division of United Aircraft, earned \$268,126 during the third quarter of 1952, as against \$168,801 in the third quarter of 1951. Unit earnings during the two quarters were 44 cents and 38 cents, respectively, or \$59,000 on per share outstanding. Net profits for the first nine months of this year were \$251,071 after taxes and other charges, about 54 cents a share, earnings falling the same period of 1951 totaled \$360,668, or 66 cents a share.

The third quarterly report of Waco Aircraft Company is also at the blackboard, to report profits and an increasing production. A net profit, after depreciation, taxes and other charges, of \$15,357, contrasted with a loss of \$17,460 in the third quarter last year. The company's nine months report shows a net loss of \$35,936, about a third less than the losses during the same period of 1951.

Reduction of losses was also featured in the report of the Curtis-Wright Corporation and subsidiaries. For the nine months ended Sept. 30, 1952, the net loss was \$408,504, after depreciation, interest and other charges, as compared with a loss of \$675,254 in the third quarter of 1951. Comparison of the nine months report is even more striking, with 1952 losses at \$209,406, as against \$2,186 in the corresponding period last year.

Wright Aeronautical Corporation continued by Curtis-Wright, revenues for the nine months ended Sept. 30, 1952, at \$208,312 for the third quarter this year, against profits of \$250,735 in the third quarter of 1951. Despite third quarter losses, the Wright company earned \$140,276, or 24 cents a share during the nine months ended Sept. 30, 1952. The 1951 report for the first nine months shows a loss of \$23,548.

While the net loss of \$208,660 reported by the Aviation Corporation for the quarter ended September 30 last year was not repeated, Aeronautical Corp. reports it does show a decided improvement over the second quarter of this year when losses were \$174,419. For the first nine months of this year, the

company reported a net loss of \$2,571,000, as against \$917,904 loss in the first nine months of 1951. A large percentage of the losses is in volume. Capital stock and the nine months period this year were due to the sale of securities.

Personnel

Commander Albert H. Dorsey, Commanding Officer of the U.S.S. Albatross, has been ordered to duty in connection with the U.S.S. Albatross, the third in command when it is commissioned. He has been in command of the Albatross since June, 1952 during which period the aircraft

ship has been offering a rigorous schedule of training officers and men for its sister ship, the U.S.S. Albatross, the third in command when it is commissioned. He has been in command of the Albatross since June, 1952 during which period the aircraft

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M. J. has been ordered to San Diego, Cal., to take charge of flying out of the Naval Air Station under construction there, and is continued in other assignments.

The Sperry Gyroscope Company has announced several executive changes. E. E. Gellner, formerly vice-president and general manager, has been made president, P. E. Barrett, vice-president in charge of engineering, and Robert E. Hill, vice-president in charge of sales. Thomas A. Morgan, formerly president of the company, is now chairman of the board.

STATISTICS OF THE MONTH

Summarizing the statistical news of Aviation, March, 1952. Page numbers refer to this issue.

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Cleveland (route 11) route, as compared with the third quarter last year.

Reduction of variation in competition among the various operators remains. The highest average per-mile competition of 77 and 78 cents was paid on the New York-Los Angeles and Chicago-San Francisco routes, respectively, during the quarter. At the other end of the scale, only five routes were below the half-dollar level last year prior to the quarter. Six cents also were in the Chicago-San Francisco route with Atlantic-Los Angeles a close second. Fifty-eight cents per mile fares was the average competition for all routes during the 1952 period, about 10 cents below the figure for the third quarter of 1951.



Available exceptions to the downward trend of mail traffic along the individual coast routes are two transcontinental lines and the up-and-down line between the Midwest and the third transcontinental system. Postage increased 16 per cent on route 34, between New York and Los Angeles and more than a third on the Midwest-Los Angeles (route 33) and Washington-

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Chronology of AVIATION

AVIATION was formed by Lester D. Gardner the first issue appearing May 1, 1948, as *Aviation and Aeronautical Engineering*. In 1950, the *Aircraft Journal* was absorbed and the title became *Aviation and Aircraft Journal* to be amplified into *Aviation* in January, 1952. The chief editors have been: Laddie D. O'Neil, W. Lawrence La Page, Earl D. O'Brien, R. Stanley Brown, Jr., and Edward P. Wherry. The present staff consists of: Edward P. Wherry, editor; Leslie E. Norville, managing editor; S. Paul Baker, assistant editor; Eleanor Norville, circulation editor; and David J. Lenz, art director.

American airplane specifications (continued)

cellular role plays with structural gene expression—Arrows down and across representing for the down arrow

[illegible]

American engine specifications

General Information		Identification		Classification		Status		Remarks	
Name	Address	Age	Sex	Religion	Marital Status	Occupation	Education	Health	Other
1	123 Main St, New York, NY 10001	25	M	Catholic	Single	Student	High School	Good	
2	456 Elm St, Los Angeles, CA 90001	30	F	Protestant	Married	Teacher	College	Good	
3	789 Oak St, Chicago, IL 60601	45	M	Jewish	Married	Engineer	University	Good	
4	101 Pine St, San Francisco, CA 94101	55	F	Buddhist	Single	Writer	Graduate	Good	
5	202 Cedar St, Boston, MA 02101	60	M	Muslim	Married	Doctor	Postgraduate	Good	
6	303 Birch St, Philadelphia, PA 19101	70	F	Hindu	Married	Retired	High School	Good	
7	404 Spruce St, Portland, ME 04101	80	M	Sikh	Married	Farmer	High School	Good	
8	505 Ash St, Seattle, WA 98101	90	F	Christian	Married	Homemaker	High School	Good	
9	606 Hickory St, Denver, CO 80201	10	M	Muslim	Single	Student	High School	Good	
10	707 Maple St, Miami, FL 33101	20	F	Jewish	Single	Student	College	Good	

Note: All individuals are registered citizens and are of legal age and sound mind.



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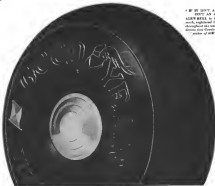
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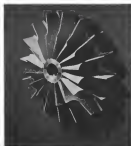
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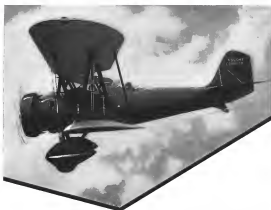
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January 15, 1933

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(SUBSIDIARY OF BENDIX AVIATION CORPORATION)

AUTOGIRO NEWS

MILWAUKEE, WIS. The Ford Power Corporation reports its machine as having completed a four-state tour of 45 states and Mexico, in which a total of 3,000 passengers were carried and 4,000 landings were made. In extremely adverse work over all types of terrain and through all types of weather, the Pitcairn Autogiro is earning its seven hundredth hour of flight.

TOKYO, JAPAN. The Japanese Government, through the Okura Trading Company, has ordered two Pitcairn Autogiros after a series of thorough test flights in this country.

MIAMI, FLA. Patrons of the exclusive Biltmore Hotel are accorded the utmost in convenience of travel to Miami Beach with the addition of an Autogiro and pilot to the hotel's facilities.

NEW YORK CITY. Escorted by three other Autogiros, Pitcairn Autogiro's new experimental four-place cabin model, embodying new conceptions of luxurious economy in air travel, was flown on its extensive inspection tour of the new Rockefeller Center development. Air camera recorded the event for newspapers all over the world.



PITCAIRN AUTOGIRO LANDING IN CENTRAL PARK, NEW YORK CITY

A striking demonstration of one of the ways in which the Autogiro can vastly widen the utility of air travel occurred on November 15, 1932.

On a mission in connection with the work of the New York Emergency Unemployment Committee, pilot James G. Ray landed a Pitcairn Autogiro in a Central Park meadow, in the heart of New York City.

Repeated landings in small city areas, and even on city boulevards, indicate the ability of the Autogiro to utilize limited landing places in bringing air transportation directly to congested areas with accuracy.

Upon receipt of request on business stationery a complete, authoritative presentation of the Autogiro, in book form, will be sent without cost.

AUTOGIRO



Hand Inertia Starters • Electric Inertia Starters • Direct Cranking Electric Starters
 • Hand Turning Gears • Battery Charging Generators (voltage regulated) • Double
 Voltage Radio Generators (voltage regulated) • Radio Dynamotors • Engine
 Driven Radio Dynamotors (voltage regulated) • Engine Driven Alternators (con-
 stant speed) • Engine Driven Vacuum Pumps (for navigating instruments) •
 Automatic Supercharger Regulators • Battery Booster Coils • Booster Magnetos
 • Fuel Flowmeters • Superchargers • Automatic Pitch Propeller Hubs • Ice
 Overshoe Air Pumps • Flexible Metallic Tubing.

Detailed data gladly supplied upon request

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